
Geometric Group Theory
Théorie géométrique des groupes
(Org: **Eduardo Martinez-Pedroza** (Memorial University) and/et **Nicholas Touikan** (UNB))

SHIVAM ARORA, Memorial University of Newfoundland

On Compactness properties of subgroups

Results of Herbert Abels show that groups in the class of locally compact groups containing a compact open subgroup admit transitive actions on locally finite graphs with compact open vertex stabilizers. This is analogous to the case of finitely generated discrete groups via Cayley graphs. There is a current program of extending geometric techniques used in the study of discrete groups to this larger class. We will give brief overview of this approach and some of the applications that we obtained regarding compactness properties of subgroups.

HADI BIGDELY, Marianopolis College

Combination of groups that contain a hyperbolically embedded collection of subgroups

Hyperbolically embedded subgroups were introduced in a paper by Dahmani, Guirardel and Osin as a generalization of relatively hyperbolic groups and were used to solve a number of open problems about the mapping class groups of closed surfaces and the outer automorphism groups of free groups.

In the first part of the talk we will introduce two equivalent definitions of groups with a hyperbolically embedded subgroup including a "Bowditch" approach introduced by E. Martinez Pedroza and F. Rashid. Then we will discuss some combination theorems of these groups which generalizes a result of Dahmani, Guirardel and Osin.

This is a joint work in progress with E. Martinez Pedroza.

JIE CHEN, McMaster University

Tabulation of flat knots

Virtual knots were introduced by Kauffman, and they represent knots in thickened surfaces up to stable equivalence. Each virtual knot determines a flat knot, which is the homotopy class of the immersed curve in the surface. In this talk, I will discuss a project for tabulating flat knots that is based on an approach pioneered by Turaev. I will discuss the algorithm and challenges of implementing it for flat knots. Prior work of Gibson gave a tabulation of flat knots up to 4 crossings, and our results extend this to flat knots up to 8 crossings. I will also discuss how to use various different invariants of flat knots, such as their based matrices and arrow polynomials, to distinguish the different equivalence classes. This talk represents joint work with L. White.

SAM HUGHES, University of Oxford

Profinite completions and fibering

We will survey a number of results about fibering groups and manifolds over the circle. In the case of 3-manifolds we will highlight a remarkable connection to profinite rigidity. Finally, we will make a similar connection in the setting of almost finitely presented subgroup separable groups. Based on joint work with Dawid Kielak.

CHANDRIKA SADANAND, Bowdoin College

Hyperbolic cone surfaces and polygonal billiards

Consider a polygon-shaped billiard table in the hyperbolic plane on which a ball can roll along geodesics and reflect off of edges infinitely. In joint work with Viveka Erlandsson and Chris Leininger, we have characterized the relationship between the shape

of the polygon and the set of possible sequences of edges visited consecutively by billiard balls rolling and reflecting around the polygon. In order to do this, we made an arguably more interesting characterization: when a hyperbolic metric with cone points on a surface is determined by the geodesics that do not pass through cone points. In this talk, we will explore these characterizations and the tools used to prove them.